Phytologia (September 1989) 67(2):158-167.

NEW SPECIES, NEW SECTIONS, AND A TAXONOMIC OVERVIEW OF AMERICAN *PLUCHEA* (COMPOSITAE: INULEAE)

Guy L. Nesom
Department of Botany, University of Texas, Austin, Texas 78713 U.S.A

ABSTRACT

Two new species of *Pluchea*, both related to *P. foetida* and *P. rosea*, are proposed from México. **Pluchea yucatanensis** sp. nov. is described from Belize and the Yucatán peninsula of México and its occurrence is noted as an adventive in the United States. **Pluchea mexicana** comb. nov. is endemic to alkaline plains of northeastern San Luis Potosí. The two newly proposed species and others with sessile, clasping and mostly oblong leaves are segregated as **Pluchea** sect. **Amplectifolium** sect. nov., and a key is provided to the six American species of that group. In addition, the identity of sect. *Pluchea* is clarified and another section is proposed, sect. **Pterocaulis** sect. nov., with plants characterized by winged stems from decurrent leaves. *Pluchea sericea* is maintained within the genus as sect. *Phalacroline* A. Gray, possibly closely related to *Pluchea lanceolata*.

KEY WORDS: Asteraceae, *Pluchea*, México, floristics, taxonomy.

Pluchea comprises about 40 species. More than half of these are in the New World, with the remainder in Africa, Asia and Australia. Robinson & Cuatrecasas (1973) reviewed the generic boundaries among *Pluchea, Tessaria* and *Berthelotia*, but apart from this and the early studies of de Candolle and Asa Gray, there has been no attempt to delimit the infrageneric structure of *Pluchea*. In the the course of a floristic study of Mexican *Pluchea*, it quickly became clear that for the most part, the American species could be arranged in morphologically distinct groups, and in the present paper formal status is proposed for these as sections. Old World species have been associated with these groups in some cases, but a more complete view of the genus still remains to be provided. Nevertheless, I believe the preliminary structure proposed here will prove to be helpful. Descriptions are first presented for two new Latin American species.

Godfrey (1952) segregated *Pluchea rosea* Godfrey from *P. foetida* (L.) DC. Both are species primarily of the southeastern United States and the West

Indies. He also described *P. rosea* var. *mexicana* Godfrey, a series of populations restricted to México and disjunct from the main range of *P. rosea*. In reviewing the taxonomy of Mexican *Pluchea*, I find that two separate elements are represented among the plants cited by Godfrey as *P. rosea* var. *mexicana*, and I recognize one of them as a species distinct from *P. rosea*.

Pluchea mexicana (Godfrey) Nesom, comb. et stat. nov. Based on *Pluchea rosea* Godfrey var. *mexicana* Godfrey, J. Elisha Mitchell Sci. Soc. 68:269. 1952. TYPE: MÉXICO. San Luis Potosí: alkaline plains, Hacienda de Angostura, 5 Aug 1891, *C.G. Pringle 3813* (HOLOTYPE: GH; Isotypes: C,F!,MU!,NY,PH,US!).

Erect, herbaceous perennials ca 4-6 dm tall. Stems with a mixture of sessile and stipitate glands and long, thick, multicellular, non glandular trichomes. Leaves alternate, lanceolate- oblanceolate-oblong, erect-ascending, 25-45 mm long, 7-18 mm wide, with minutely serrulate margins, sessile, clasping, slightly auriculate, coarsely pubescent with a dense mixture of thick, long and short, gland tipped hairs and thick, viscid hairs with colored crosswalls, sessile resin glands absent or mixed with the stipitate ones. Heads 6-7 mm wide, sessile, immediately subtended by bracteal or reduced leaves. Phyllaries lanceolate, in 3-4 series of nearly equal length, the innermost 5-6 mm long, rose-purple with sharply delimited, light colored margins, sclerified and mostly glabrous on the lower half, stipitate glandular and viscid pubescent with thick trichomes on the upper half. Pistillate flowers numerous, the corollas filiform, pink to purplish, 4.4-4.9 mm long, minutely 3 lobed and glandular at the apex, the style branches barely if at all exserted; hermaphroditic flowers ca 25-30, the corollas 5 mm long, gradually ampliate, the lobes triangular-lanceolate, glandular, purplish. Achenes cylindrical, 6 nerved, very sparsely strigose and glandular, mature size not seen; pappus a single series of 18(-20) minutely barbellate bristles 4 mm long.

Additional collections examined. MÉXICO. San Luis Potosí. Media Luna, near Río Verde, *Palmer 75* (CM,F,MO,US); Minas de San Rafael, plains between Tiburcio and Angostura, June 1911, *Purpus s.n.* (F,US); and July 1911, *Purpus s.n.* (F,MO,US). These three collections were cited by Godfrey (1952) as *P. rosea* var. *mexicana*.

Pluchea mexicana is endemic to the gypseous, alkaline plains (ca 800-1000 m) north of Río Verde, San Luis Potosí and flowers June to July. This area is common to several other narrow endemics of Compositae (i.e., *Geissolepis suaedaefolia* B. Robinson, *Stephanodoria tomentella* (B. Robinson) E. Greene, *Viguiera potosina* S.F. Blake, *Pinaropappus multicaulis* Brandegee and *Cirsium excelsius* (B. Robinson) Petrak. Attempts in September 1988 to relocate populations of the *Pluchea* and *Cirsium* were unsuccessful, although the other species noted above were found.

Pluchea mexicana differs from *P. rosea* in its vestiture of stipitate glandular hairs, sometimes mixed with sessile glands and thick, viscid but non glandular hairs. *Pluchea rosea* has only sessile glands and a puberulous vestiture of non glandular hairs that are apically attenuate and usually drawn out into long filiform extensions. Additionally, the phyllaries of *P. mexicana* are mostly of even length, the basal portions are strongly sclerified, they are rosy with sharply delimited, white margins and only the outermost are densely hairy. The inner are glandular but otherwise sparsely hairy to glabrous. Godfrey (1952, p. 269) also observed some of these differences and noted that the vestiture of the plants from San Luis Potosí is ". . . quite unlike anything found in [*P. rosea*] elsewhere." I also call attention to the disjunct geographical position of the plants from San Luis Potosí and their very different habitat; *P. rosea* is known only from coastal or near coastal sites, and in México, it is known from scattered localities (cited below). I believe the distinctive morphological features of these inland plants are of enough significance to warrant separating *P. mexicana* at the specific rank, although it seems clear that the two taxa are closely related.

Pluchea rosea was noted by Godfrey (1952) to occur in the southeastern United States, West Indies and México. With the separation of *P. mexicana*, only one of the Mexican collections he cited as *P. rosea* remains correctly identified as that species (Quintana Roo), but I have studied additional collections of *P. rosea* from Central America, which are included among the following: BELIZE. Between London and Rancho along the old Northern Highway to Maskall, wet margin of *Eleocharis* marsh, 50 m, 20 Mar 1987, *Davidse & Brant 32896* (US).

HONDURAS. Depto. Gracias a Dios, W of Brus Laguna, cut over forest, sea level, 23 Apr 1971, *Nelson & Hernández s.n.* (MO).

MÉXICO. Quintana Roo, in savanna, Lake Chichancanab (Laguna Chankabnab), 28-29 Jul 1932, *Steere 2407* (F,US).

NICARAGUA. Dept. Zelaya: ca 11.9 km SW of Bismuna Tara, along river in savanna, 19 Apr 1978, *Stevens 7732* (F-2 sheets); vicinity of Awastara, savanna, 2 Jul 1980, *Stevens 17759* (F).

Another taxon distinctive in morphology but apparently unnamed is known from several collections primarily from the Yucatán peninsula of Belize and México.

Pluchea yucatanensis Nesom, sp. nov. TYPE: MÉXICO. Campeche: In savanna, Champoton, 7-15 Jul 1932, *Steere 1844* (HOLOTYPE: LL!; Isotype: US!).

P. mexicanae habitu et morphologia foliorum sed absentia trichomatum nonglandiferorum differt. Phyllaria interioria linearilanceolata, 5-6 mm longa, extima ovati-lanceolata longitudine interioria aequantia.

Perennials 2-6 dm tall, single stemmed from the base and unbranched until the capitulescence, the stems, leaves and phyllaries glandular but lacking other pubescence. Leaves leathery and slightly succulent, with sessile to slightly stipitate glands, alternate, mostly oblong-obovate with obtuse, mucronulate apices, subclasping and slightly auriculate, ascending to erect, 3-5 cm long, (6-)15-19 mm wide, slightly reduced in size immediately below the capitulescence, the margins serrulate with (6-)8-11 pairs of small teeth or mucros. Heads 8-14 in small, terminal, corymboid clusters, on ultimate pedicels 2-5 mm long, each immediately subtended by a lanceolate bracteal leaf, turbinate to campanulate turbinate, 4-5 mm wide; phyllaries densely and prominently stipitate glandular near the apices, stipitate to sessile glandular below, without other pubescence, in 3-4 slightly graduated series, the innermost linear lanceolate, 5-6 mm long, the outer ovate lanceolate, equally as long or nearly so, or sometimes only ca half as long. Pistillate flowers numerous, the corollas pink to lavender, filiform, 3.0-3.3 mm long, minutely 3 lobed and glandular at the apex, the style branches exserted 0.3-1.0 mm; hermaphroditic flowers 20-22, the corollas pink to cream, 4.5-5.0 mm long, gradually ampliate, the lobes linear lanceolate, 0.9-1.0 mm long, glandular. Achenes cylindrical, 0.8-0.9 mm long, 6-8 nerved, sparsely strigose, eglandular; pappus of 18-20, minutely barbellate bristles 4.3-4.8 mm long.

Additional collections examined: BELIZE. 9.8 mi S of Belize, mangrove swamp, 5 Jun 1973, *Croat 23817* (LL,MO,US); 1 mi W of jct with road to Ferguson Bank, ca 8 mi E of Hattiesville, along Hector Creek Rd, low, intermittently wet area, many temporary ponds, sedges, palmetto, and broad-leaved scrub, 16 Aug 1971, *Sorensen 7072* (F,MO,US); mile 13, Western Highway, growing in pools in sandy, waste ground, 30 Aug 1980, *Whitefoord 2268* (MO).

UNITED STATES. Mississippi: Hancock Co., sandy, low area along Jordan River S of Kiln, edge of mixed woods with *Serenoa, Sabal, Nyssa, Taxodium*, 30 May 1967, *Jones 12656* (TEX).

Pluchea yucatanensis appears to be restricted essentially to the Yucatán peninsula of México and Belize, where it occurs at low elevations near the coast and flowers June to August. One collection of *P. yucatanensis* has been made from a near coastal locality in Mississippi of the southern United States, where it probably is adventive. It is similar to *P. rosea* in habit and leaf morphology but the whole plant without any type of pubescence except primarily sessile glands. The leaves are leathery and slightly succulent and are restricted at flowering to the upper half of the strictly erect, unbranched stems.

PLUCHEA SECTION *AMPLECTIFOLIUM*

Both taxa newly proposed here as species, as well as *P. oblongifolia* of eastern South America and *Pluchea rosea, P. foetida* and *P. longifolia* of North and Central America, have erect to ascending, lanceolate to oblanceolate-oblong

leaves with serrulate margins and sessile, clasping, slightly auriculate bases. The plants are herbaceous perennials and produce strictly erect, mostly unbranched stems. The inner phyllaries are not strongly differentiated from the outer. The species vary among themselves in the production of glands and eglandular trichomes on the achenes. Both pistillate and hermaphroditic corollas have glandular lobes. In all of these species, the uppermost bracteal leaves in the capitulescence are reduced in size and petiolate, pointing to a close relationship with sect. *Pluchea*, which has petioled leaves. These taxa form a closely related cluster of species that I recognize as a distinctive section within the genus. The African species *Pluchea dioscoridis* (L.) DC. has similar leaf morphology and may also belong here, but it has eglandular corolla lobes and glandular anther appendages. A key to the American species of the section follows.

Pluchea sect. **Amplectifolium** Nesom, sect. nov. TYPE SPECIES: *Pluchea foetida* (L.) DC.

Folia erecti-ascendentia oblanceolati-oblonga marginibus serratis et basibus sessilibus amplectentibus parum auriculatis.

ARTIFICIAL KEY TO THE AMERICAN SPECIES OF SECT. *AMPLECTIFOLIUM*

1. Leaves mostly 8-20 cm long, 3-7 cm wide; heads campanulate-cylindric, the innermost phyllaries 9-11 mm long, middle phyllaries 2.5-3.0 mm wide; southern Florida ..... *P. longifolia* Nash

1. Leaves mostly 3-10 cm long, 1-3 cm wide; heads turbinate-campanulate, the innermost phyllaries 5-8 mm long, middle phyllaries 1.0-1.5 mm wide (2)

2. Plants stipitate to sessile glandular, without other pubescence; Yucatán peninsula of México and Belize, adventive in Mississippi, United States ..... *P. yucatanensis* Nesom

2. Plants glandular with sessile, resin glands or gland tipped hairs, also hairy ..... (3)

3. Plants with gland tipped hairs, sessile resin glands lacking or mixed with numerous stipitate ones; phyllaries in several series of nearly equal length, sclerified and mostly glabrous on the proximal half, viscid pubescent with thick trichomes and stipitate glandular on the distal half; east central San Luis Potosí, México ..... *P. mexicana* (Godfrey) Nesom

3. Plants with sessile, translucent, yellowish, resin glands, stipitate glands absent or rare; phyllaries in several strongly graduated or even series, relatively evenly thick-herbaceous, moderately to densely puberulent or appressed villous from base to tip with fine hairs ..... (4)

4. Heads basally rounded with a prominent impression at the peduncle insertion; phyllaries with 3-7, prominent, thin, longitudinal nerves, the outer and inner phyllaries of relatively even length, glandular and cobwebby ciliate margined but mostly without other vestiture; coastal Brasil ..... *P. oblongifolia* DC.

4. Heads basally rounded and impressed to obtuse; phyllaries 1 nerved, equal to prominently graduated in length, at least the outermost glandular and puberulent villous ..... (5)

5. Heads 6-12 mm wide, basally rounded to impressed; phyllaries thinly arachnoid pubescent, with sessile glands, the inner 5-8 mm high, the outer ovate, much shorter than the inner 2-3 series; phyllaries and corollas creamy white; southeastern United States to Texas, also Hispañola and Veracruz, México, where probably adventive .. *P. foetida* (L.) DC.

5. Heads 5-9 mm wide, basally obtuse to barely acute; phyllaries usually arachnoid and commonly also with dense, thick, viscid hairs, the inner 4-6 mm high, the outer ovate-acuminate to ovate-lanceolate, half to equally as long as the innermost; corollas and often the phyllaries pink to purplish; SE United States to Texas, West Indies, Gulf and scattered localities along the Caribbean coast from Campeche, México, to Nicaragua ..... *P. rosea* Godfrey

Pluchea rosea is very similar to *P. foetida* and many apparent intermediates are found in the southeastern United States. The notes by Cronquist (1980) are particularly helpful in distinguishing the two. The plants of *P. rosea* cited from Nicaragua may be influenced by genes from *P. yucatanensis*, because the heads are somewhat narrower and less pubescent and the phyllaries narrower and more equal in length than in plants typical of the southeastern U.S.

I have seen only one collection of *Pluchea foetida* from anywhere in Central America or México: Veracruz, 3 km antes de llegar a las Choapas, 13 May 1980, *Calzada 5964* (TEX). It is typical in morphology of conspecific plants of the southeastern United States.

PLUCHEA SECT. *PLUCHEA*

Pluchea Cass., Bull. Sci. Soc. Philom. Paris 1817:31. 1817. TYPE SPECIES: *Conyza marilandica* Michx. [=*P. purpurascens* (Sw.) DC. = *P. odorata* (L.) Cass., *sensu* Gillis, 1977].

Stylimnus Rafin., J. Phys. Chim. Hist. Nat. 89:100. 1819. TYPE SPECIES: *Conyza marilandica* Michx. *Pluchea* sect. *Stylimnus* (Rafin.) DC., Prodr. 5:540. 1836. Other synonyms as noted by Godfrey (1952).

The species of sect. *Pluchea* are herbaceous to suffrutescent perennials characterized by petioled, mostly elliptic lanceolate leaves with attenuate to obtuse bases. The inner phyllaries are but little differentiated from the outer, and the achenes are sparsely hairy and variably glandular on the nerves and faces. Both pistillate and hermaphroditic corollas have glandular lobes.

Species included: *Pluchea camphorata* (L.) DC., *P. odorata* (L.) Cass., *P. fastigiata* Griseb., *P. symphytifolia* (Miller) DC. and perhaps others. *Pluchea indica* Less., an Asian species, almost certainly belongs here, but it has more strongly differentiated inner phyllaries and glandular anther appendages. As noted by Cooperrider & Galang (1965), on Pacific islands it forms sterile hybrids with *P. symphytifolia.*

PLUCHEA SECT. *PTEROCAULIS*

Another group of primarily American species shows strong morphological unity and warrants recognition as a section, which is proposed here.

Pluchea sect. **Pterocaulis** Nesom, sect. nov. TYPE SPECIES: *Pluchea salicifolia* (Miller) S.F. Blake

Caules alati extensionibus foliorum lineari-lanceolatorum serratorum longi-decurrentium.

Species included: *Pluchea laxiflora* Hook. & Arn., *P. macrocephala* DC., *P. microcephala* Godfrey, *P. parvifolia* (A. Gray) Godfrey, *P. sagittalis* (Lam.) Cabr. (including *P. suaveolens* (Vell.) O. Kuntze and *P. salicifolia* (including *P. subdecurrens* Cass. and *P. adnata* (Willd.) Mohr). The African species *P. ovalis* (Pers.) DC. appears to belong here as well.

The species of *Pluchea* sect. *Pterocaulis* are suffrutescent perennials characterized by stems completely winged by the basal extensions of the linear-lanceolate, serrate, long decurrent leaves. Both pistillate and hermaphroditic corollas have glandular lobes. The achenes vary among species in their production of hairs and glands. The species limits among these taxa are in need of taxonomic study.

PLUCHEA SECT. *PHALACROLINE*

Robinson & Cuatrecasas (1973) presented a seminal discussion of generic limits among the New and Old World species centered around *Pluchea*, including *Tessaria* and *Berthelotia*, although I believe the groupings proposed in the

present paper will also prove to be useful as a starting point for understanding the phylogeny. In my opinion, Robinson & Cuatrecasas were correct in recognizing the polyphyletic aspect of *Tessaria sensu* Cabrera (1939) but incorrect in limiting the genus to only *T. integrifolia* Ruiz & Pavon, which clearly is congeneric with *T. absinthioides* (Hook. & Arn.) Cabrera. The two are set apart from the rest of *Pluchea* by their combination of alveolate and paleaceous receptacles, spreading reflexed inner phyllaries, extremely peculiar style nectary floral morphology, thickened margins of the hermaphroditic flowers, pappus bristles basally united into a thick cylindrical cup and glabrous achenes. *Tessaria integrifolia* is the more advanced of the two species in its typically solitary (but variable in number), hermaphroditic flowers with deeply cleft corolla lobes. The taxonomy accepted by Robinson & Cuatrecasas (1973) was summarized by their recognition of two genera among the plucheoid species: 1) a heterogeneous *Pluchea*, including *Berthelotia* and 2) *Tessaria*.

Pluchea sericea (Nutt.) Coville of the southwestern United States and northwestern México has recently been treated as *Tessaria* (Correll & Johnston, 1970), but it clearly does not belong with that genus, as it lacks the distinctive features of floral and pappus morphology. As suggested by Rydberg in the publication of his combination to *Berthelotia*, it may be related to the Afro-Asian species *P. (Berthelotia) lanceolata* (DC.) Hiern. (the type of *Berthelotia*), with which it shares pappus bristles with expanded apices and a sericeous vestiture. Gray also allied it with *Berthelotia* (see below). If treated as a monotypic genus, Aven Nelson's name is already available. Until more detailed and incisive techniques are applied to the study of its relationships, I maintain it as *Pluchea* and recognize its isolated position among American members of the genus, but possible relatedness to *P. lanceolata*, by treating it as a member of section *Phalacroline*.

Pluchea sect. *Phalacroline* A. Gray, Pl. Wright. 1:102. 1849. TYPE SPECIES: *Tessaria borealis* A. Gray (=*Pluchea sericea*). Gray discussed a possible relationship between the type species and *Berthelotia lanceolata*.

Pluchea sect. *Berthelotia* (DC.) A. Gray, Proc. Amer. Acad. Arts 17:212. 1882. *Berthelotia* DC., Prodr. 5:375. 1836. TYPE SPECIES: *B. lanceolata* DC. (=*Pluchea lanceolata* (DC.) Hiern.). Gray cited both *B. lanceolata* and *Tessaria borealis* as members.

Eremohylema A. Nelson, Univ. Wyoming Pub. Bot. 1:54. 1924. TYPE SPECIES: *E. sericea* (Nutt.) A. Nelson (=*Pluchea sericea*).

Because the nomenclature of *Pluchea sericea* has been somewhat confused, a summary is presented here.

Pluchea sericea (Nutt.) Coville, Contr. U.S. Natl. Herb. 4:128. 1893. Based on *Polypappus sericeus* Nutt., J. Acad. Nat. Sci. Philad. ser. 2, 1:178.

1847. TYPE: UNITED STATES. "Rocky Mountains of Upper California," *Gambell s.n. Berthelotia sericea* (Nutt.) Rydb., Bull. Torrey Bot. Club 33:154. 1906. *Eremohylema sericea* (Nutt.) A. Nelson, Univ. Wyoming Pub. Bot. 1:54. 1924. *Tessaria sericea* (Nutt.) Shinners, Sida 3:122. 1967.

Tessaria borealis Torrey & A. Gray ex A. Gray, Pl. Fendl. 75. 1849. Gray cited collections (SYNTYPES) by Fremont, Coulter and Emory. *Tessaria borealis* A. Gray, nom. superfl., Pl. Wright. 1:102. 1852. *Pluchea borealis* (Torrey & A. Gray ex A. Gray) A. Gray, Proc. Amer. Acad. Arts 17:212. 1882.

Tessaria borealis was attributed several times by Gray (1849; 1882) to Torrey & Gray (ex A. Gray in Pl. Fendl.). Shortly after his study of the Fendler collections, Gray republished the name with a type and Latin description as *T. borealis* A. Gray (1852), but this must be regarded as superfluous. In the same paper, he noted that a still earlier publication of the same name was mistakenly attributed to DeCandolle by Torrey (in Emory, Notes Military Reconn. 143. 1848) and that it had been intended as an enumeration, not a description. Nuttall's original name, *Polypappus sericeus* (1847), was given as a synonym in both of Gray's reports (1849; 1852).

Some shrubby species of *Pluchea* in South America do not belong with any of the groups discussed here. *P. dodoneaefolia* (Hook. & Arn.) H. Robins. & Cuatr., *P. zamalloae* (Cabrera) H. Robins. & Cuatr. and *P. fiebrigii* H. Robins. & Cuatr. were noted by Robinson & Cuatrecasas (1973, p. 280) to form a "macroscopically evident group," and *P. chingoyo* DC. of Perú appears to be morphologically isolated, although its cordate, short petiolate leaves may point to a relationship with the species of sect. *Amplectifolium*.

The only other named section of *Pluchea* of which I am aware is sect. *Hebephora* DC. (Prodr. 5:453. 1836). In it De Candolle included two Asian species, *P. hirsuta* (L.) Less. and *P. scabrida* DC., which have fimbrillate-hirsute receptacles. Judging from the descriptions, these may be related to sect. *Pluchea*.

ACKNOWLEDGMENTS

I thank Carol Todzia and Billie Turner for their reviews and comments and F, MO, US and CM for loans of specimens.

LITERATURE CITED

Cabrera, A.L. 1939. Las especies Argentinas del genero "*Tessaria*." Lilloa 4:181-189.

Cooperrider, T.S. & M.M. Galang. 1965. A *Pluchea* hybrid from the Pacific. Amer. J. Bot. 52:1020-1026.

Correll, D.S. & M.C. Johnston. 1970. *Manual of the Vascular Plants of Texas*. Texas Research Foundation, Renner, Texas.

Cronquist, A. 1980. *Vascular Flora of the Southeastern United States*. Volume I, The Asteraceae. Univ. North Carolina Press, Chapel Hill.

Gillis, W.T. 1977. *Pluchea* revisited. Taxon 26:587-591.

Godfrey, R.K. 1952. *Pluchea*, section *Stylimnus*, in North America. J. Elisha Mitchell Sci. Soc. 68:238-271.

Robinson, H. & J. Cuatrecasas. 1973. The generic limits of *Pluchea* and *Tessaria*. Phytologia 27:277-285.